

2002 Survey of Community Drinking Water Systems

- **Consumer Cost**
- **Rate Structures**
- **Infrastructure Conditions**
- **Presence of Irrigation Systems**
- **Conservation Plans**
- **Anticipated Projects**

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Utah Department of Environmental Quality

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Forward

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This report is also available from DDW's web site:

[**http://drinkingwater.utah.gov/survey.htm**](http://drinkingwater.utah.gov/survey.htm)

The web site will contain any corrections or updates made after the initial publication of this document.

The Division of Drinking Water attempts to provide complete and accurate data and information. However, due to the nature of this survey, this cannot be assured and the information herein is provided "as-is".

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Executive Summary

- The average consumer cost of drinking water in Utah is **\$32.96 per month per connection**. This figure includes only user billings and taxes. It does not include impact fees, connection fees or other sources of water supplier revenue.
- The average Utah consumer cost, \$32.96 per month per connection, is comprised of the following: \$27.20 from retail billings (83%) and \$5.76 from taxes (17%).
- The unit cost of drinking water in Utah is \$1.39 per 1000 gallons. This figure reflects billings and taxes. It does not include impact fees, connection fees or other sources of water supplier revenue.
- In 2002, Utah's drinking water systems received \$262 million in revenue from billings, taxes, impact fees and connection fees.
- In 2002, the statewide Median Adjust Gross Income (MAGI) in Utah was \$32,266 per year. The average Utah connection had a culinary water bill of \$32.96 per month, or \$396 per year. Thus, the average yearly culinary water bill amounts to 1.22% of statewide MAGI.
- Most Utah water systems (61%) have a "uniform" rate structure. That is, for overages, the unit cost of water remains the same as water use increases. However, it is noteworthy that the percentage of systems with "increasing" rate structures has increased from 28% to 36% since 1999. "Increasing" rate structures tend to promote water conservation.
- 58% of Utah's drinking water systems have a secondary irrigation system (either piped or ditch) available in at least some part of their service area. (The costs associated with irrigation service are not included in this survey.)
- Only 27% of Utah's systems collect significant funds which are held in reserve for future improvements.
- 16% of Utah's systems are currently inadequate, worn out or have significant immediate problems.
- 68% of Utah's systems have submitted water management and conservation plans.
- In the next four years, Utah's water suppliers will spend approximately \$154 million per year on new projects.
- In the next twenty years, Utah's water suppliers will spend approximately \$2.6

billion on new projects. However, this estimate must be used cautiously because data is lacking in this area.

- 60% of Utah's community water systems do not have master plans.

2002 Survey Report

Introduction

The Utah Division of Drinking Water (DDW), in conjunction with the Utah Division of Water Rights and the Utah Division of Water Resources, annually conducts a survey of the state's community drinking water systems. The results of the 2002 survey are presented herein.

A community drinking water system is defined as a water system which serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.

Of the 457 community drinking water systems in the state, 308 responded to the survey. Of these 308, only 244 responded satisfactorily with respect to water bill information. However, these 244 systems represent approximately 88% of the total number of connections served by all community drinking water systems in the state.

A Discussion of Typical Revenue Sources and Expenses

Before continuing, it would be worthwhile to review the economics of water system operation.

The goal of any water system is to have a balanced budget. For-profit systems are also interested in making a profit for their investors. To that end, the yearly income of a water system should equal or exceed the system's expenditures.

Typical system expenditures are shown in Table 1.

To offset expenditures, water systems rely on a variety of income sources. Table 2, taken from a US Government Accounting Office (GAO) publication, provides a listing of the possible income sources for water utilities. This table also shows the percentage of utilities in the U.S. which utilized a particular funding source in their most recently completed fiscal year.

Table 1 – Typical Water System Expenses (1)	
Operation And Maintenance	
	Source of supply
	Pumping
	Water Treatment
	Transmission and Distribution
	Customer Accounting
	Administrative and General
Capital Requirements	
	Debt Service
	Debt Service Reserve
	Capital Improvements
(1) American Water Works Association, <i>Water Rates (Manual M1)</i> , (2002), Table 1-1 (adapted)	

Table 2 - Estimated Percentages of Utilities That Used Each Source of Funding in Their Most Recently Completed Fiscal Year (1)		
<i>1</i>	User charges	98%
	Other local revenues	
<i>2</i>	Hook-up, connection or tap fees	89%
<i>3</i>	Interest earned	77%
<i>4</i>	Sales to other utilities	42%
<i>5</i>	Permit and inspection fees	41%
<i>6</i>	Reserves	35%
<i>7</i>	Assessments	14%
<i>8</i>	Property taxes	8%
<i>9</i>	Special operating cost levies	3%
	Grants	
<i>10</i>	State grants	21%
<i>11</i>	Federal grants	16%
	Debt and Equity	
<i>12</i>	Revenue Bonds	36%
<i>13</i>	State loans	25%
<i>14</i>	General Obligation Bonds	19%
<i>15</i>	Federal loans	12%
<i>16</i>	Commercial loans	9%
<i>17</i>	Private activity bonds	2%
<i>18</i>	Sale of stock	2%
(1) United States General Accounting Office, <i>Water Infrastructure – Information on Financing, Capital Planning, and Privatization</i> , (GAO-02-764, 2002), Table 1		

The historic goal of DDW’s survey is to determine the “consumer cost” of drinking water in Utah. This is viewed as the cost borne by consumers through **periodic billings and yearly property taxes**. Thus the “average consumer cost” reported herein reflects only Items 1 and 8 in Table 12.

Connection Fees and Impact Fees, which can be ascribed to Item 2 in Table 12, are **not** included in the “average water bill” shown below. Furthermore, Item 4, “Sales to Other Utilities” (i.e. Wholesale Income) is not directly included in DDW’s survey. It is assumed that wholesale costs are reflected in water sales data provided by downstream

retailers.

There are other studies which attempt to describe the “cost” of water. When reviewing any published information on the cost of water, the reader should be aware of what elements go into the number. When comparing water cost information from various sources, it is important to compare “apples with apples”.

Finally, the reader must be careful not to judge the capability of water suppliers based upon the cost of the water they deliver. There are many factors that contribute to water cost, as summarized in Table 1. High water costs may be entirely justified by the nature of the system and it’s condition.

Average Consumer Cost (Appendix 1)

For 2002, the average cost of culinary water for consumers was **\$32.96** per month per connection. **This figure includes money paid through periodic billings and taxes, but does not include impact fees or connection fees.** This is a decrease of 2.8% from the figure reported in 2001 (\$33.89).

The apparent decrease might be explained by the quality and variability of the data. However, it is more likely that the decrease is a result of a heightened emphasis on water conservation. The emphasis on water conservation is being driven by drought conditions and population growth.

It is important to note that the average water bill is determined from the income (billings and taxes) reported by community **drinking water** systems. As discussed later in this report, it is estimated that 56% of Utah’s drinking water systems also have irrigation systems (either piped or ditched) serving some or all of their customers. The costs associated with irrigation system service are **not** captured by this survey.

A history of the survey results is shown in Table 3.

Appendix 1 presents a listing of all public community drinking water systems in the State, and the water bill information which they provided. Note that this Appendix is broken into five categories: Systems that obtain revenue only from retail billings; Systems that obtain revenue from billings and taxes; Large regional districts that primarily wholesale

Table 3: Average Consumer Cost (\$/month/connection)	
Year	Avg. Cost (Billings and Taxes)
2002	\$32.96
2001	\$33.89
2000	\$30.13
1999	\$27.77
1998	\$26.28
1997	\$24.47
1996	\$25.12
1995	\$20.88
1994	\$20.41
1993	\$19.57
1992	\$20.53
1991	\$19.16
1990	\$18.89
1989	\$17.03

water; Systems which responded to the survey, but did not provide revenue data; And systems which did not respond to the survey.

As mentioned above, the average consumer cost (from billings and taxes) in 2002 was \$32.96 per month per connection. Of this amount, \$27.20 (83%) came from retail billings, and \$5.76 (17%) came from taxes.

Revenues Received by Drinking Water Systems (Statewide)

Table 4 summarizes **all** the revenue received by community water systems from billings, taxes, impact fees and connection fees. The figures shown in this table are extrapolations from the data received. The extrapolations are necessary because data was received for only 88% of the State's connections.

Table 4: Revenues Received by Utah Water Systems In 2002		
Category	Amount	%
From Billings	\$195 million	74%
From Taxes	\$41 million	16%
From Impact Fees	\$18 million	7%
From Connection Fees	\$8 million	3%
TOTAL	\$262 million	100%

Water Bill As A Percent of Median Adjusted Gross Income

The Statewide Median Adjusted Gross Income (MAGI) for 2001 was \$32,266. (At this writing, MAGI data for 2002 are not available.) The average Utah connection had a culinary water bill of \$32.96 per month (from billings and taxes). Thus, the statewide average culinary water cost was 1.22% of MAGI. (Impact fees and connection fees are excluded from this analysis.)

A history of consumer cost as a percent of MAGI is shown in Table 5.

Table 5: Consumer Cost as % of MAGI	
Year	%
2002	1.22%
2001	1.25%
2000	1.11%
1999	1.09%
1998	1.04%
1997	1.01%
1996	1.13%
1995	1.00%
1994	1.00%
1993	0.94%
1992	1.06%
1991	1.12%

Residential Water Rate Structures (Appendix 2)

229 systems presented adequate information on their residential water rate structures. They are tabulated in Appendix 2.

Rate structures can be characterized by how the expense of water varies with increasing use. Water conservation tends to be encouraged if the water cost increases as more water is used. Rate structures can be characterized as “uniform”, “increasing” or “decreasing”.

Note that the type of rate structure is determined by examining only the pricing trend of overage blocks. The base rate is not considered. Furthermore, a rate structure with only one overage block is considered "uniform".

Presented below are the findings of this year’s survey. For comparison purposes, findings from 2001 and 1999 are also presented. (No such analysis was done in 2000.) As can be seen, there appears to be a trend of more “increasing cost” structures. This is probably a result of ongoing drought conditions, and associated water conservation measures taken by systems to reduce consumption.

Table 6: Types of Rate Structures									
		2002			2001			1999	
Residential Rate Structure Type		Num of Systems	% of Systems		Num of Systems	% of Systems		Num of Systems	% of Systems
Decreasing Cost		3	1%		5	2%		8	4%
Uniform Cost		140	61%		138	66%		164	70%
Increasing Cost		86	<u>38%</u>		65	<u>31%</u>		61	<u>26%</u>
TOTAL		229	100%		208	100%		233	100%

\$ per 1,000 Gallons (Appendix 3)

Earlier in this report, the cost of water was characterized by the “average water cost”. This was expressed as “\$ per connection per month”. It was determined by simply adding a system’s billing income and tax income, and then dividing by the number of connections.

While this type of analysis does have value, there are some variables that can confound the results. For instance, climatic conditions may change. If water supplies are ample, the average water bill would tend to go up during a dry, hot year. Conversely, during wet periods, the average water bill would tend to decrease.

Another way to look at the cost of water is on a “\$ per 1000 gallons” basis. This perspective may be less subject to climatic variables.

Appendix 3 tabulates those systems which provided sufficient information to allow a “\$ per 1000 gallon” determination. Table 7 summarizes the findings. The “Billings and Taxes” figure shown below was determined by an extrapolation based on the finding (presented previously) that 18% of total monthly consumer cost (\$ per connection per month) was attributable to taxes.

Table 7: \$ per 1000 gallons	
Billings Only	\$1.15
Billings and Taxes	\$1.39

On average, Impact Fees and Connections Fees provide approximately 10% of a water supplier’s income. However, these fees are not included in the above analysis because of their “one-time” nature.

Secondary Irrigation Systems (Appendix 4)

Utah is somewhat unique in that many of the State’s drinking water systems also have a “secondary” irrigation system within their service area. The secondary system is often not under the ownership of the drinking water system. The secondary system provides lower quality water for the irrigation of lawns, gardens and, occasionally, agricultural use.

Appendix 4 tabulates all community drinking water systems in the State. It also shows information on piped or ditch secondary irrigation systems which are present within the drinking water system’s service area.

174 of the 308 systems which returned questionnaires (56%) have secondary irrigation water (either piped or ditch) available in at least some part of their service area. Refer to Appendix 4 for a listing of these systems.

Note that the costs associated with irrigation services are outside the scope of this report and are not included in any financial analysis.

General Physical and Financial Condition of Water Systems (Appendix 5)

The survey asked water providers to do a self-assessment of the physical and financial conditions of the water systems. Refer to Appendix 5 for detailed information in this regard. Some significant findings are noted below.

- a. 6% of water systems are operating in the red. Some of these systems transfer funds from other activities. Others plan to raise rates.
- b. Only 27% of systems collect significant funds which are held in reserve for future improvements.
- c. 16% of systems are currently inadequate, worn out or have significant immediate problems. Another 41% of the systems were judged to be only adequate for another 3 years.
- d. 32% of systems rate their ability to provide fire protection water as "fair" or "poor".
- e. 2% of distribution systems are in bad shape.

Water Management and Conservation Plans (Appendix 6)

By state law, all water systems serving more than 500 connections must have a water management and conservation plan. Appendix 6 lists those systems which have submitted plans to the Utah Division of Water Resources. The following table summarizes the findings. (Note: The data for this analysis was provided by the Utah Division of Water Resources.)

Table 8: Water Management and Conservation Plans		
Plan Status	Number of Systems	%
Submitted	94	68%
Not Submitted	45	32%
Total	139	100%

Future 4 Year Expenditures For Drinking Water Projects (Appendix 7)

Survey respondents indicated that in the years 2003 through 2006 they would spend a total of \$541 million on drinking water projects. This amounts to an average of \$135 million per year. Appendix 7 provides specific information on anticipated projects.

If the above survey results are extrapolated to the entire state (based on a survey response rate of 88%), project expenditures in the years 2003 through 2006 would total \$614 million. This amounts to an average of \$ 154 million per year.

The following table indicates a history of anticipated project spending (extrapolated).

Table 9: Anticipated Project Spending		
Survey Year	Future 4 year spending (million)	Avg. per year (million)
02	\$614	\$154
01	\$736	\$184
00	\$602	\$151
99	\$569	\$142
98	\$647	\$162
97	\$498	\$125
96	\$261	\$65
95	\$376	\$94
94	\$380	\$95

Future 20 Year Expenditures For Drinking Water Projects

The previous section provides an estimate of how much will be spent on drinking water projects in the next four years. This section considers the next twenty years.

The EPA has tried to estimate the infrastructure needs in Utah as part of a national survey conducted every four years. Both in 1995 and 1999, the 20 year estimate was put at approximately \$500,000,000. But, this estimate seems rather low.

Table 7, above, indicates that Utah's water systems over the last 8 years have spent an average of \$130 million per year on drinking water projects. Simply extrapolating this to a 20 year period yields a total expenditure of \$2.6 billion (in today's dollars). This is 5 times the amount estimated by EPA's National Infrastructure Survey.

Furthermore, the true 20-year need may actually be higher than our estimated \$2.6 billion

because of the following:

- The above estimate of \$2.6 billion over 20 years in no way takes into account population increases during that period. Utah's population is estimated to increase by 1 million people (from 2.3 million to 3.3 million) in the next 20 years. This is likely to further increase drinking water project expenditures.
- Our data tends to reflect the typical and ongoing capital expenses incurred by water suppliers. Our data would not reflect various "mega-projects" now being considered to meet future water demand (such as a pipeline from Lake Powell to St. George). Including these projects would further drive up anticipated expenses.

A 20-year analysis is further complicated because future water conservation measures will likely reduce per-capita consumption. Decreasing per-capita consumption will tend to reduce capital expenditures.

So, more detailed research appears necessary to better estimate 20-year expenditures. Such research is complicated by the fact that only 16% of Utah's community water systems have master plans that go out at least 20 years. (See below.)

In the absence of better data, we believe an estimate of \$2.6 billion over 20 years (\$130 million per year) appears reasonable.

Existence of Master Plans (Appendix 8)

In the survey, systems were asked to describe whether they had master plans in place and how far out the plans went. The results are presented in Appendix 8.

Only 16% of the systems indicated that they had master plans that extend out for at least 20 years. 24% had master plans for a period less than 20 years out. 60% of the systems which responded indicated they had no master plan in place.

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